

# CUMULATIVE INDEX 2000

## Volume 21

March	SMOKING AND PULMONARY CARDIOVASCULAR DISEASES, pages 1-212
June	THE PATHOBIOLOGY OF ASTHMA: IMPLICATIONS FOR TREATMENT, pages 213-400
September	ACUTE RESPIRATORY DISTRESS SYNDROME, pages 401-620
December	CHRONIC OBSTRUCTIVE PULMONARY DISEASE, pages 621-879

Note: Page numbers of article titles are in **boldface** type.

Abdominal muscles, respiratory muscle drive to, 685  
N-Acetylcysteine (NAC), for ARDS, 575

Acute lung injury (ALI), **401-417**. See also *Acute respiratory distress syndrome (ARDS)*.

airway pressure-release ventilation for, 504

arterial blood gas measurements in, 407

clinical diagnosis of, 406

clinical manifestations of, 405

definitions associated with, 401-402, 467-470

diagnostic criteria for, 402

effects on alveolar surfactant proteins, 474

epidemiology of, 467-470

experimental studies of, 484-487

genetic susceptibility in, 472-474

genomic polymorphisms in, 473

heterogeneous lung injury in, 493-495

high-frequency ventilation for, 502

incidence of, 402-403

inhaled nitric oxide and, **519-529**. See also *Nitric oxide*.

administration of, 522-524

dosage of, 524

extra-gas exchange effects of, 525

nonresponders to, 524

responders to, 524

therapeutic associations with, 524-525

interleukins in, 470-471, 472

inverse ratio ventilation for, 503-504

laboratory studies of, 406-407

mechanical ventilation in, **491-510**

adjuncts and alternatives to, 501-505

improvements in, 505-506

traditional approach to, 491-493

mechanisms of, **467-476**

mediators in, **467-476**

inflammatory role in, 470-471

modulators in, inflammatory, role of, 471-472

mortality related to, 412-413

NIPPV for, 504-505

outcomes following, 412-416

permissive hypercapnia for, 501-502

pressure control ventilation for, 503

repair and remodeling following, mechanisms of, **589-616**. See also *Acute respiratory distress syndrome (ARDS)*, repair and remodeling following.

risk factors for, 403-405

stretch-induced, prevention of, 495-497

surfactant replacement therapy in, clinical trials of, 538-539

tracheal gas insufflation for, 502

tumor necrosis factor in, 470, 472

ventilation-associated, 493-495

and inflammatory cytokine release, 495

from overdistention or stretch, 493-494

from ventilation with atelectasis at end-expiration, 493-495

prevention of, 498-501

prevention of, lung-protective strategies in, 495-501

Acute respiratory distress syndrome (ARDS), **401-417**.

See also *Acute lung injury (ALI)*.

age as factor in, 404

airway pressure-release ventilation for, 504

alveolar duct fibrosis in, 448

and neonatal respiratory distress syndrome, similarities between, surfactant replacement therapy in, 534-535

anti-inflammatory properties of, 548-549

apoptosis and, 592-593

barotrauma in, 422-426

bronchoalveolar lavage in, 408

cardiogenic versus noncardiogenic or increased-

permeability pulmonary edema in, 428

chest radiography in patients with, effects of PEEP on, 428-429

clinical diagnosis of, 406

clinical disorders associated with, 403

clinical manifestations of, 405

clinicopathologic correlations in, 463

complications of, 421-427

course of, 411

CT in patients with, 429-431

defined, 401-402

diagnostic criteria for, 402

differential diagnosis of, 408-411

diffuse alveolar damage in, 458, 462-463

temporal features of, 436

extracorporeal life support effects on, 560

frequency of, 404

heterogeneous lung injury in, 493-495

## Acute respiratory distress syndrome (ARDS) (Continued)

- high-frequency ventilation for, 502
- incidence of, 402-403
- inhaled nitric oxide in, clinical trials of, 525-527
- inverse ratio ventilation for, 503-504
- laboratory studies of, 406-407
- liquid ventilation in, 422
- lung inflammation in, persistence of, 593-596
- lung surfactant system in patients with, abnormalities of, 531-539
- mechanical ventilation in, **491-510**
  - improvements in, 505-506
  - traditional approach to, 491-493
- mortality related to, 412-413
- MRI in patients with, 431
- natural history of, 411
- NIPPV for, 504-505
- outcomes following, 412-416
- partial liquid ventilation for, **543-554**. See also *Perfluorocarbon liquids*.
  - animal experience with, 545-547
  - combination and adjunctive uses of, 547-548
- pathology of, 589-591
- permissive hypercapnia for, 501-502
- pneumonia in, 427
- postmortem arteriographic patterns in, 454-456
- pressure control ventilation for, 503
- prone ventilation for, **511-517**
  - effect on oxygenation, 511-512
  - gas exchange improvements with, mechanisms of, 512-515
  - morbidity and mortality effects of, 515-516
- pulmonary pathology of, **435-466**
  - exudative phase of, 435-440
  - fibrotic phase of, 451
  - proliferative phase of, 440-451
- pulmonary vascular remodeling, 451-458
- pulmonary vasculature in, 452-458
- radiographic findings in, **419-433**
  - historical notes in, 419
- radionuclide examinations in, 429
- regional alveolar damage in, 458-462
- repair and remodeling following, 596-608
  - alveolar epithelial repair in, 597-599
  - alveolar fluid clearance acceleration in, 606-607
  - alveolar inflammation reduction in, 601-602
  - antioxidant defense increase in, 600-601
  - antiprotease defense increase in, 601
  - apoptotic pathway alterations in, 608
  - cytoprotection in, 604
  - epithelial barrier repair in, 604-606
  - fibrosis reduction in, 603-604
  - increased severity of initial or secondary injury in, 600-608
  - intra-alveolar granulation tissue clearance in, 607
  - keratinocyte growth factor in, 604-605
  - local or systemic infection reduction in, 603
  - removal of excess collagen in, 596-597
  - strategies to augment, 599-608
  - surfactant repletion in, 603
  - vascular, 599
- ventilator-induced lung injury reduction in, 602
- risk factors for, 403-405
- support lines of, 421-422
- surfactant replacement therapy in, **531-541**
  - adjunctive treatments, 539
  - future directions in, 539
- survivors of, pulmonary function in, 414
- quality of life in, 414-416
- tissue malfunction and injury in, treatment of, **563-587**

tracheal gas insufflation for, 502

- treatment of, almitrine bismesylate in, 578-579
  - antagonism of endotoxin in, 564-566
  - anticytokine agents in, 576-577
  - anti-inflammatory agents in, 566-571
  - antioxidants in, 564, 574-575
  - antiproteases in, 564, 575-576
  - clinical trials of, 580-581
  - corticosteroids in, 567-570
  - cyclooxygenase inhibitors in, 570-571
  - ketoconazole in, 579-580
  - nitric oxide in, 573-574
  - pentoxifylline in, 579
  - permissive hypercapnia in, 580-581
  - pharmacologic, **563-587**
  - prostaglandins in, 571-574
  - surfactant in, 578
  - vasodilators in, 571-574
  - Acute ventilatory failure, pathophysiology of, 799-800
  - Addiction, nicotine, genetics of, 638-639
  - Adenovirus, latent, in COPD, 625
  - Adolescent(s), smoking in, 5-6
    - initiation of, 60-62
  - Adrenal suppression, corticosteroids for COPD and, 746-747
  - Adult bronchopulmonary dysplasia, 451
  - Age, as factor in ARDS, 404
  - Aging, skeletal muscle dysfunction in COPD caused by, 669
  - $\beta$ -Agonists, for COPD, 727-728
    - in chronic asthma management, 381-384
  - $\beta_2$ -Agonists, in acute asthma management, 363-365
  - Air pollution, COPD exacerbation caused by, 708
  - Airflow obstruction, cigarette smoke-induced, anatomic basis of, 78
  - Airway(s), in acute asthma, size of, 362
    - inflammation of, assessment of, gold-standard tests in, 345
      - bronchoscopic markers of, exhaled nitric oxide and, 355
    - ideal tests for, 345-346
    - in asthmatics, noninvasive measurement of, **345-360**
      - respiratory virus effects on, 294-296
    - sputum analysis in, 346-351
  - large, COPD in, 621
    - smoking-related changes in, 14-21, 76
    - smoking-related inflammation in, 21
  - neural control of, in asthmatics, 293
  - remodeling of, descriptive analysis of, 331-336
  - growth factor expression in, 336-337
  - in vivo* experimental models of, 337-339
  - mechanisms of, 336-339
  - physiologic significance of, 336
  - protease and antiprotease expression in, 337
- small, COPD in, 622-623
  - in chronic asthma, 237
  - virus-induced asthma effects on, 293-294
- upper, smoking effects on, **147-157**
- wall thickening of, 331-333
- Airway epithelium, smoking-related changes in, 17
- Airway lumen, smoking-related changes in, 14-17
- Airway obstruction, asthma-induced inflammation and, 324
  - smoking and, 141-143
- viral-induced, mechanisms of, 293-296
- Airway pressure-release ventilation (APRV), in acute lung injury, 504
- in ARDS, 504
- Airway wall, smoking-related changes in, 17-21

- Albuterol, in acute asthma management, 364  
 ALI. See *Acute lung injury (ALI)*.  
 Allergen(s), responses to, viral infections and, interactions between, 296  
     Th2 response caused by, 268  
 Allergen immunotherapy, Th1/Th2 paradigm in, 270-271  
 Allergy(ies), prenatal and postnatal smoke exposure on development of, 42-43  
 Almitrine bismesylate, for ARDS, 578-579  
 Alveolar buds, 449  
 Alveolar damage, diffuse, in ARDS, 458  
     regional, in ARDS, 458  
 Alveolar duct fibrosis, 448  
 Alveolar epithelial barrier, catecholamine-independent upregulation of, 482-483  
     in lung fluid balance in clinical lung injury, 477-490  
 Alveolar epithelial repair, in ARDS repair and remodeling, 597-599  
 Alveolar fluid clearance, acceleration of, in ARDS repair and remodeling, 606-607  
     basal rate of, 478-479  
     catecholamine-dependent upregulation of, 480-482  
     in vivo, active sodium transport regulates in, 477-483  
 Alveolar fluid transport, aquaporins in, 483-484  
     in acute lung injury, experimental studies of, 484-487  
     under pathologic conditions, 484-487  
 Alveolar surfactant proteins, composition and function of, acute lung injury in, 474  
 Alveolus(i), COPD in, 623-624  
 American-European Consensus Conference (AECC), 401  
 Aminophylline, in acute asthma management, 371-372  
 Anabolic drugs, for COPD, 673  
     for nutritional support in COPD, 759-760  
 Angiogenesis, in asthmatics, 334  
 Anterior sulcus sign, 426  
 Antibiotic(s), for COPD, 731  
     for COPD exacerbations, 711-713  
 Anticatabolic agents, for nutritional support in COPD, 760  
 Anticholinergic(s), for COPD, 725-727  
 Anticytokine agents, for ARDS, 576-577  
 Antigen(s), von Willebrand's factor, 407  
 Anti-inflammatory agents, for ARDS, 564, 566-571  
     in chronic asthma management, 385-386  
 Antioxidant(s), for ARDS, 564, 574-575  
     for COPD, 732-733  
 Antioxidant balance, in COPD, 628  
 Antioxidant micronutrients, tobacco use effects on, 174-175  
 Antiprotease(s), for ARDS, 564, 575-576  
 Antiproteolysis, in COPD, 634-637  
 $\alpha_1$ -Antitrypsin deficiency, COPD and, 634-636, 732  
 Anxiety, COPD and, 733  
 Apnea(s), obstructive, prenatal and postnatal smoke exposure on development of, 43  
 Apoptosis, and ARDS, 592-593  
     pathways of, repair and remodeling following, in ARDS repair and remodeling, 608  
 Aquaporin(s), in alveolar fluid transport, 483-484  
 ARDS. See *Acute respiratory distress syndrome (ARDS)*.  
 Arterial blood gas (ABG) measurements, in ARDS, 407  
 Arterial oxygenation, common denominator of, 503  
     primary determinant of, 503  
 Arteriole(s), in smokers, 22-23  
 Artery(ies), intra-acinar, 452  
     muscular, in smokers, 22  
     preacinar, 452  
     pulmonary, anatomy of, 451-452  
     stiffening of, smoking and, 165  
 Artery wall, smoking effects on, 164-165  
 Arthritis, rheumatoid, smoking and, 130-131  
 Asbestosis, smoking and, 129-130  
 Asthma. See also *Asthma, acute*; *Asthma, chronic*.  
     acute, airway size in, 362  
     assessment of, 217-218  
     failures of, 218  
     clinical manifestations of, 216  
     immunobiology of, 213-214  
     literature review of, 362-363  
     obstruction in, site of, 214-215  
     pathobiology of, 213-224, 361-362  
     pathogenesis of, 215-216  
     pathology of, 213-214  
     patients at risk for, 219-221  
     physiologic manifestations of, 216-217  
     severity of illness in, 363  
     sudden, expected deaths caused by, 218-219  
     treatment of, 361-379  
          $\beta_2$ -agonists in, 363-365  
         aminophylline in, 371-372  
         emergency department discharge on "controller agents" in, 375  
         furosemide in, 373  
         halothane in, 373  
         helium in, 372  
         in hastening outpatient recovery and prevention of relapse, 374-375  
         ipratropium bromide in, 368-369  
         isoflurane in, 373  
         ketamine in, 373  
         leukotriene-modifying agents in, 373  
         levalbuterol in, 373  
         magnesium in, 370-371  
         mucolytic agents in, 373  
         oxygen mixtures in, 372  
         steroids in, 365-368  
         inhaled, 373  
         intramuscular, 374-375  
     airway inflammation in, assessment of, breath condensate in, 356-357  
     exhaled breath testing in, 351-356  
     gold-standard tests in, 345  
     noninvasive measurement of, 345-360. See also *Airway(s), inflammation of*.  
     angiogenesis caused by, 334  
     atopic, development of, viruses in, 279-287. See also *Asthma, virus-induced*.  
     bacterial infections in, 301-313  
         *Chlamydia pneumoniae* and, 308-311  
         *Mycoplasma pneumoniae* and, 305-308  
         organisms in, 305-311  
     chronic, airway smooth muscle hypertrophy and hyperplasia caused by, 236  
     B lymphocytes in, 234-235  
     basophils in, 232-233  
     cytokines in, 236-237  
     eosinophils in, 230-232  
     epithelial cells in, 235-236  
     extrinsic versus intrinsic, 237-238  
     histopathology of, overview of, 225-226  
     inflammatory cells in, 226-236  
     mast cells in, 233-234  
     mucous production in, 237  
     neutrophils in, 234  
     pathology of, 225-244  
     small airways in, 237  
     structural cells and remodeling in, 236-238  
     subepithelial fibrosis caused by, 236  
     T lymphocytes in, 226-230

## Asthma (Continued)

- treatment of, **381-395**
  - $\beta$ -agonists in, 381-384
  - anti-inflammatory agents in, 385-386
  - corticosteroids in, 386-387
  - cromolyn in, 387
  - investigational agents in, 388-389
  - leukotriene modifiers in, 387-388
  - methylxanthines in, 384-385
  - nedocromil in, 387
  - theophylline in, 384-385
- fatal, pathophysiology of, 221-222
- genetics of, **245-262**
  - candidate studies in, 249-258
  - chromosome 6, 251-253
  - chromosome 11 in, 253-255
  - chromosome 12q15-24 in, 255-256
  - chromosome 16p12 in, 256-258
  - cytokine gene cluster on 5q31-33 in, 249-251
  - genome-wide screens for, 246-249
  - genome-wide searches in, 245-246
  - HLAs in, 251-253
  - IL4RA gene in, 256-258
  - MHC genes in, 251-252
  - positional candidate gene studies in, 249-258
  - TNF in, 253
- in children, in population-based cohorts, 319-322
- lung growth effects of, 315-316
- natural history of, 316-322
- induced sputum in, uses of, 346-348
- inflammation in, abnormalities in innervation caused by, 335
  - abnormalities in matrix composition caused by, 335-336
  - cartilage and, 335
  - consequences of, **331-343**
  - impaired airway function caused by, 324
  - increased mucus-producing cells caused by, 333
  - long-term, **315-329**
  - myofibroblast hyperplasia caused by, 334
  - smooth muscle alterations caused by, 333
  - vascular dilatation caused by, 334
- lung function decline caused by, 323-324
  - treatment effects on, 324-326
- mortality from, 326
- natural history of, **315-329**
- near-fatal, pathophysiology of, 221-222
- pathobiology of, factors in, **245-262, 263-277**. See also *Asthma, genetics of; Asthma, Th1/Th2 paradigm in.*
  - in murine and human models, 265
  - pathogenesis of, bacterial organisms in, 305-311
  - perinatal and postnatal smoke exposure on development of, 41-42
  - remission of, 322
  - severity of, children's exposure to environmental tobacco smoke and, 42
- Th1/Th2 paradigm in, **263-277**
  - allergen exposure and, 268
  - environmental factors in, 269
  - for therapeutic uses, 269-273
  - genetic factors in, 268-269
- virus-induced, **289-300**
  - airway obstruction caused by, 293-296
  - and allergic sensitization, 283-284
  - animal models, 292
  - atopy in, 291
  - effects of, 292-293
  - eosinophils dysfunction in, 282
  - epidemiology of, 279-280
  - epithelial cells in, 294-295

- granulocytes in, 295
- increased bronchial hyperresponsiveness with, 293
- infection caused by, 281-282
- inflammation caused by, 281-282
- M2-receptor dysfunction in, 282
- mechanisms of, 293-296
- mononuclear cells in, 295-296
- prevention of, 284-285

Atelectasis, at end-expiration, ventilation with, ventilation-associated lung injury from, 493-501, 498-501

Atherogenesis, smoking and, 165-166

Atopy, genetics of, genome-wide screens for, 246-249  
genome-wide searches in, 245-246  
in virus-induced asthma, 291

Axial pathway, 452

B lymphocytes, in chronic asthma, 234-235

Bacteria, COPD exacerbation caused by, 706-707

Bacterial infections, in asthma, **301-313**. See also *Asthma, bacterial infections in.*

Bacterial pneumonia, smoking effects on, 123-124

Bacterial product, in COPD, 625

Bactericidal/permeability-increasing protein (BPI), for ARDS, 565

Barotrauma, in ARDS patients, 422-426

mechanical ventilation for, in COPD, 808-809

Basophil(s), in chronic asthma, 232-233

Behavior modification, in nicotine dependency syndrome, 202

Blood, smoking-induced changes in, 162

Bone(s), corticosteroids for COPD effects on, 747

Breath condensate, in airway inflammation in asthma, 356-357

Breath testing, exhaled, in airway inflammation

assessment, 351-356

Breathing, pattern of, 685-687

respiratory muscle interaction in, 685-687

Bronchial cartilage, smoking-related changes in, 20-21

Bronchial reactivity, exhaled nitric oxide and, 356

Bronchial responsiveness, increased, in virus-induced asthma, 293

Bronchial smooth muscle, smoking-related changes in, 20

Bronchial tree, nitric oxide inhalation impact on, 522

Bronchial walls, pits in, smoking-related, 17-18

Bronchiolitis, respiratory, smoking and, 127-128

Bronchitis, chronic, radiologic assessment of, 659-660

Bronchoalveolar lavage (BAL), in ARDS, 408

Bronchodilator(s), for COPD exacerbations, 710

Bronchopulmonary dysplasia, adult, 451

Bronchoscopy, in lung cancer, 97

Bullous emphysema, 13

radiologic assessment of, 657-659

Bupropion, in nicotine dependency syndrome, 203, 204-207

sustained-release, in nicotine dependency syndrome, 204-207

Caffeine, for COPD, 728-729

Cancer, hypopharyngeal, smoking-related, 149-151

laryngeal, smoking-related, 151

lung, smoking among women and, 50-57

oropharyngeal, smoking-related, 149-151

smoking and, 177-179

Cardiopulmonary bypass (CPB), lung injury caused by, 576

Cardiovascular disease, smoking and, 159-172, 176-177.

See also *Smoking, and cardiovascular disease.*

Cardiovascular system, smoking effects on, 162-166

Cartilage, bronchial, smoking-related changes in, 20-21  
in asthmatics, 335

Cathelicidin(s), for ARDS, 565-566

CD4+ cells, development of, 264-265

CD80, immune modulation using, 273

CD86, immune modulation using, 273

Centriacinar emphysema, 13

Cervical mediastinoscopy, in lung cancer, 100

Chemotherapy, in stage I non-small cell lung cancer,  
111-112

neoadjuvant, in stage I non-small cell lung cancer,  
113-114

Chest radiography, in ARDS patients, 419-421

in lung cancer, 95-96

Chicken pox, smoking effects on, 124

Children, asthma in, lung growth effects of, 315-316.

See also *Asthma, in children.*

respiratory health in, smoking and, 37-46

smoking in, 5-6

*Chlamydia pneumoniae*, asthma caused by, 308-311

Chromosome 6, in asthma, 251-253

Chromosome 11, in asthma, 253-255

Chromosome 12q15-24, in asthma, 255-256

Chromosome 16p12, in asthma, 256-258

Chronic obstructive pulmonary disease (COPD). See  
also *Emphysema.*

abnormal gas exchange in, physiology of, 78-79

abnormalities in, skeletal muscle dysfunction, 669

altered energy and substrate metabolism in, 755-756

alternative hypotheses in, 630

alveolar repair in, 629-630

antioxidant balance in, 628

$\alpha_1$ -antitrypsin deficiency and, 732

$\alpha_1$ -antitrypsin deficiency in, 634-636

anxiety caused by, 733

collagenases in, 627-628

cor pulmonale in, 731-732

cystatins in, 627

cysteine in, 627

defined, 705

depression caused by, 733

diagnosis of, screening tests in, criteria for, 646-647  
spirometry in, 645-652. See also *Spirometry, in  
COPD.*

dyspnea and, 733

epidemiology of, 705

genetic, 633-634

exacerbation of, 705-721

air pollution and, 708

bacteria and, 706-707

causes of, 706-708

corticosteroids in, efficacy of, 740-742

disordered gas exchange in, mechanisms of, 706

noninvasive ventilation in, 794

pathophysiology of, 705-706

prevention of, 708-709

treatment of, 709-716

outcomes after, 716-717

viruses and, 707-708

exercise intolerance in, mechanisms and measures of,  
693-704. See also *Exercise; Exercise intolerance, in  
COPD.*

exercise training in, 763-781

benefits of, duration of, 775-776

improvement after, mechanisms of, 774-775

indications for, 764-765

intensity of, 767-770

lower extremity, 765-767

respiratory muscle training, 773-774

strength training, 770-771

type of, 767-770

upper extremity, 771-773

historical perspective of, 621

in alveoli, 623-624

in large airways, 621

in small airways, 622-623

insomnia caused by, 733

load on respiratory muscles, 683-684

malnutrition caused by, 733

mechanical ventilation in, 799-818

advance directives in, 812-813

barotrauma and, 808-809

complications of, 807-809

goals of, 800-801

hemodynamic collapse in, 807-808

intrinsic PEEP in, 805-807

patient monitoring in, 805-807

setting ventilator in, 801-805

weaning from, 809-812

noninvasive ventilation in, 783-797

application of, 791-794

benefits of, 788-789

contraindications to, 790-791

Health Care Financing Agency guidelines for, 790

hypothesis testing in, 785-787

muscle resting hypothesis in, 783-785

testing of, 785-787

patient selection for, 789-791

physiologic basis for, 783-785

sleep hypothesis in, 785

testing of, 787

nutritional abnormalities in, 753-762

anabolic agents in, 759-760

anticatabolic agents in, 760

exercise and, 754

future perspective of, 759-760

health-related quality of life and, 754

morbidity associated with, 755

mortality associated with, 754-755

muscle function and, 754

nutritional support for, practical implementation of,  
758-759

timing of, 758

outcome of, 757-759

prevalence of, 753-754

reduced dietary intake in, 756-757

pathogenesis of, evolving concepts in, 621-632

inflammation in, 624-629

pathologic changes in, 621-624

peripheral muscle dysfunction in, 665-677

anabolic drugs in, 673

clinical consequences of, 670

evidence of, 665-668

muscle fiber type, size, and capillarization in, 666-  
667

muscle mass and strength and, 665-666

muscle metabolic capacity and endurance in, 667

muscle metabolism at rest and during exercise, 667

nutritional intervention in, 672

oxygen therapy for, 673

treatment of, 670-673

upper extremity and respiratory muscles versus  
lower limb muscles, 667-668

proteinase-antiproteinase balance in, 625-629

psychological variables in, 700

radiologic assessment of, advances in, 653-663

respiratory muscle dysfunction in, causes of, 680-683



Chronic obstructive pulmonary disease (COPD) (*Continued*)

- evidence of, 679-680
  - respiratory muscle function and drive in, 679-692
  - respiratory stimulants and, 734
  - risk factors for, 67-70
    - genetic, 633-643
      - antiproteolysis, 634-637
      - identification of susceptibility genes, 634
      - inflammatory mediators in, 638
      - modifier, 638-640
      - mucociliary clearance in, 638
      - ventilatory response to hypoxia and hypercapnia, 639-640
    - xenobiotic metabolizing enzymes in, 637-638
  - skeletal muscle dysfunction in, causes of, 668-670
  - smoking cessation for, 723-724
  - smoking-related, 57-59, 179-180
    - burden of, 79
    - mechanisms of, 75-76
    - oxidant-antioxidant hypothesis in, 74-75
    - pathogenesis of, 71-76
    - protease-antiprotease hypothesis in, 71-73
  - smoking-related lung damage caused by, 705-706
  - steroid-responsive, 742-743
  - treatment of,  $\beta$ -agonists in, 727-728
    - antibiotics in, 731
    - anticholinergics in, 725-727
    - antioxidants in, 732-733
    - combination therapy in, 739
    - corticosteroids in, 730, 739-752. *See also* Corticosteroid(s), *for* COPD.
    - inhalers in, 729-730
    - methylxanthines in, 728-729
    - mucolytics in, 730-731
    - outcomes after, 724-725
    - oxygen in, 731
    - pharmacologic, 723-738
    - prescribing patterns in, 734-735
    - protease inhibitors in, 732
    - smoking cessation in, 723-724
    - vaccination in, 724
    - vitamins in, 732-733
- Cigar smoking, 6
- effects of, 151-152
- Cigarette smoke, airflow obstruction caused by,
  - physiology of, 78
  - composition and deposition of, 70-71
- Cigarette smokers, COPD in, 645-646
- Cigarette smoking. *See also* under *Smoking*.
- and COPD, 67-68
  - diseases related to, 173-187
    - in adolescents, initiation of, 60-62
    - in women, as symbol of emancipation, 47-48
  - cessation of, 59-60
  - COPD caused by, 57-59
  - history of, 47-49
  - lung cancer caused by, 50-57
  - prevalence of, 47
  - respiratory health effects of, 47-65
- Cold, common, smoking and, 122-123
- Collagen, excess, removal of, in ARDS repair and remodeling, 596-597
- Collagenase(s), in COPD, 627-628
- Common cold, smoking and, 122-123
- Common denominator, of arterial oxygenation, 503
- Computed tomography (CT), high-resolution, in respiratory bronchiolitis, 660
- in ARDS patients, 429-431
  - in emphysema, 654-657
  - in lung cancer, 96
- Continuous diaphragm sign, 424
- Contraceptive(s), oral, smoking in users of, 168
- COPD. *See* Chronic obstructive pulmonary disease (COPD).
- Cor pulmonale, in COPD, 731-732
- Corticosteroid(s), for ARDS, 567-570
- for COPD, 730, 739-752
    - adrenal suppression caused by, 746-747
    - adverse effects of, 746-749
    - bone effects of, 747
    - cardiovascular effects of, 749
    - cutaneous effects of, 748-749
    - efficacy of, 740
    - gastrointestinal effects of, 747-748
    - glucose intolerance caused by, 748
    - infectious complications of, 748
    - myopathy caused by, 748
    - ocular effects of, 749
    - psychiatric effects of, 748
  - for COPD exacerbations, 713-716
  - in chronic asthma management, 386-387
  - inhaled, for COPD, 743-746
  - skeletal muscle dysfunction in COPD caused by, 669
- Cotinine, 37
- Cromolyn, in chronic asthma management, 387
- CT. *See* Computed tomography (CT).
- Cyclooxygenase inhibitors, for ARDS, 570-571
- Cystatin(s), in COPD, 627
- Cysteine, in COPD, 627
- Cystic fibrosis transmembrane regulator, in COPD, 638
- Cytochrome P450 2A6, in COPD, 639
- Cytochrome P4501A1, in COPD, 637-638
- Cytokine(s), for ARDS, 564
  - immune modulation using, 271-273
  - in chronic asthma, 236-237
  - in COPD, 624
  - inflammatory, in acute lung injury, 470, 471
  - T-cell helper 2-type, 228-230
- Cytokine gene cluster, on 5q, 31-33, 249-251
- Cytokine inhibitors, for ARDS, 564
- Cytology, sputum, in lung cancer, 97
- Cytoprotection, in ARDS repair and remodeling, 604
- Cytotoxic T cells, 226
- Deconditioning, skeletal muscle dysfunction in COPD caused by, 668
- Deel sulcus sign, 426
- Deoxyribonucleic acid (DNA), nitric oxide with, 520-521
- Depression, COPD and, 733
- Desquamative interstitial pneumonia (DIP), 25-27
  - defined, 25
  - smoking-related changes in, 25-26, 27
- Diaphragm, respiratory muscle drive to, 684
- Diffuse alveolar damage (DAD), defined, 401
  - immunohistochemical profile and morphogenesis of, in ARDS, 462-463
  - in ARDS, 458
  - temporal features of, 436
- DNA (deoxyribonucleic acid), nitric oxide with, 520-521
- Dopamine receptors, in COPD, 639
- Dopamine transporter gene, in COPD, 639
- Drug(s), for COPD, 723-738
- Dysplasia, bronchopulmonary, adult, 451
- Dyspnea, COPD and, 733
- E237G, in asthma, 254-255
- Edema, pulmonary, increased-permeability, cardiogenic versus noncardiogenic, in ARDS patients, 428

- Reinke's, smoking-related, 154-155
- Education, smoking's relationship to, 5
- Electrolyte disturbances, skeletal muscle dysfunction in COPD caused by, 669-670
- Emphysema, bullous, 13
- radiologic assessment of, 657-659
  - centriacinar, 13
  - chest radiograph in, 653-654
  - CT in, 654-657
  - defined, 11, 623
  - lung volume reduction surgery for, 658-659, **819-848**
    - history of, 819-820
    - improvement after, mechanisms of, 837-839
    - outcomes after, 821-837
    - patient selection for, 839-842
    - technique of, 820-821
  - objective quantification of, 657
  - pulmonary, lung transplantation for, **849-865**. See also *Pulmonary emphysema, lung transplantation for*
  - radiologic assessment of, 653-657
  - severity of, 13-14
  - smoking-related, pathology of, 11-14
  - surgical therapy for, history of, 819-820
  - types of, 11-12
- Endoscopic ultrasonography, with fine needle aspiration, in lung cancer, 98
- Endotoxin(s), antagonism of, for ARDS, 564-566
- Endotoxin-neutralizing protein (ENP), for ARDS, 566
- Environmental factors, Th2 response caused by, 269
- Environmental tobacco smoke, lung function changes in children exposed postnatally to, 40-41
- Eosinophil(s), in chronic asthma, 230-232
- in virus-induced wheezing, 282
- Eosinophilic granuloma, smoking and, 126-127
- smoking-related changes in, 26, 28-32
- Epinephrine, in acute asthma management, 364
- Epithelial cells, in chronic asthma, 235-236
- in virus-induced asthma, 294-295
- Epithelium, airway, smoking-related alterations in, 17
- Estrogen, effects on smoking-related cardiovascular risk, 168
- Ethnicity, as factor in smoking, 4-5
- Exercise, cardiac limitation during, 698-699
- limitations of, nutritional status and, 699-700
  - peripheral muscle weakness and, 699
  - respiratory muscle function during, 696-698
  - ventilatory limitation during, 693-696
- Exercise intolerance, peripheral muscle dysfunction and, 670
- Exercise training, in COPD, **763-781**. See also *Chronic obstructive pulmonary disease (COPD), exercise training in*
- Exhaled breath testing, in airway inflammation assessment, 351-356
- Extracellular matrix fragments, in COPD, 625
- Extracorporeal life support, ARDS effects of, 560
- described, 556-557
  - for respiratory failure, **555-561**. See also *Respiratory failure, severe, extracorporeal life support for*
  - literature related to, 557-559
  - success of, 557
  - reasons for, 559-560
- Exudative phase, in ARDS, 435-440
- FCERB1,  $\beta$  chain, in asthma, 253-255
- FENO measurements, reproducibility of, 355
- Fibrosis, alveolar duct, 448
- reduction of, in ARDS repair and remodeling, 603-604
- subepithelial, in asthmatics, 333-334
- Fibrotic phase, in ARDS, 451
- Fine needle aspiration, endoscopic ultrasonography with, in lung cancer, 98
- Fluorocarbon(s), defined, 544
- Free radicals, tobacco use effects on, 174-175
- Furosemide, inhaled, in acute asthma management, 373
- Gas(es), nitric oxide as, 519-521
- Gastroesophageal reflux disease, smoking-related, 152-153
- Gender, as factor in smoking, 3-4
- Gene(s), IL4RA, in asthma, 256-258
- MHC, in asthma, 251-252
  - susceptibility, in COPD, 633-638
    - identification of, 633
- Genetic(s), in acute lung injury, 472-474
- Genomic polymorphisms, in acute lung injury, 473
- Global inspiratory muscle drive, 684
- glu237gly, in asthma, 254-255
- Glucocorticoid(s), in acute asthma management, 365-368
- Glutathione S-transferases, in COPD, 637
- Gold-standard tests, in airway inflammation assessment, 345
- Granulocyte(s), in virus-induced asthma, 295
- Granuloma, eosinophilic, smoking and, 126-127
- smoking-related changes in, 26, 28-32
- Halothane, in acute asthma management, 373
- hCAP18, 565-566
- Health Care Financing Agency guidelines, for noninvasive ventilation in COPD, 790
- Helium, in acute asthma management, 372
- Hemoglobin, nitric oxide with, 520
- Hemorrhage, pulmonary, smoking and, 124-125
- High-frequency ventilation (HFV), in acute lung injury, 502
- in ARDS, 502
- High-resolution computed tomography (HRCT), in respiratory bronchiolitis, 660
- HLAs. See *Human leukocyte antigens (HLAs)*
- Hormone(s), sex, smoking and, 167-168
- Human leukocyte antigens (HLAs), in asthma, 251-253
- Hypercapnia, permissive. See *Permissive hypercapnia (PHC)*
- ventilatory response to, in COPD, 639-640
- Hyperplasia, lymphoid, smoking-related, 153-154
- myofibroblast, in asthmatics, 334
- Hypersensitivity pneumonitis, smoking and, 131-132
- Hypopharyngeal cancer, smoking-related, 149-151
- Hypoxemia, skeletal muscle dysfunction in COPD caused by, 669
- Hypoxia, ventilatory response to, in COPD, 639-640
- Ibuprofen, for ARDS, 570-571
- Idiopathic pulmonary fibrosis, smoking and, 128-129
- IL4RA gene, in asthma, 256-258
- Immune response, respiratory syncytial virus and, 291-292
- Immune system, smoking effects on, 122
- Immunoglobulin(s), IgE, immune modulation using, 273
- in asthma, 253-255
- Immunotherapy, allergen, Th1/Th2 paradigm in, 270-271

- Inactivity, skeletal muscle dysfunction in COPD caused by, 668
- Infection(s), reduction of, in ARDS repair and remodeling, 603
- respiratory viruses and, 281-282, 283
- Inflammation, airway. *See Airway(s), inflammation of.*
- asthma-induced, 331-343. *See also Asthma, inflammation in.*
- in COPD, 624-629
- long-term, in asthma, 315-329
- of large airways, smoking-related, 21
- of lung, in ARDS, persistence of, 593-596
- respiratory viruses and, 281-282
- skeletal muscle dysfunction in COPD caused by, 668-669
- systemic, smoking effects on, 122
- vocal cord, smoking-related, 154-155
- Inflammatory cells, in chronic asthma, 226-236
- in COPD, 624-625
- Inflammatory cytokine(s), in acute lung injury, 470, 471
- Inflammatory cytokine release, ventilation-associated lung injury and, 495
- Inflammatory immune response, smoking and, 175-176
- Inflammatory mediators, in acute lung injury, 470-471
- Inflammatory modulators, in acute lung injury, 471-472
- Influenza, smoking effects on, 123
- Inhaler(s), for COPD, 729-730
- Insomnia, COPD and, 733
- Intercostal muscles, respiratory muscle drive to, 684
- Interferon-gamma, immune modulation using, 271-272
- in COPD, 625
- Interleukin(s), development of, noninflammatory mechanisms in, 282-283
- IL-4, immune modulation using, 272-273
- IL-5, immune modulation using, 273
- IL-9, immune modulation using, 273
- IL-12, immune modulation using, 271-272
- IL-13, immune modulation using, 272-273
- in COPD, 625
- in acute lung injury, 470-471, 472
- Interstitial lung diseases, desquamative, smoking-related changes in, 25-26, 27
- eosinophilic granuloma, smoking-related changes in, 26, 28-32
- respiratory bronchiolitis-associated, smoking and, 127-128
- smoking-related changes in, 23-25
- rheumatoid arthritis-associated, smoking and, 130-131
- smoking and, 126-133
- asbestosis, 129-130
- eosinophilic granuloma, 126-127
- hypersensitivity pneumonitis, 131-132
- idiopathic pulmonary fibrosis, 128-129
- pathology of, 23-32
- sarcoidosis, 132-133
- Intra-acinar arteries, 452
- Intra-alveolar granulation tissue clearance, in ARDS repair and remodeling, 607
- Inverse ratio ventilation (IRV), in acute lung injury, 503-504
- in ARDS, 503-504
- Ipratropium bromide, in acute asthma management, 368-369
- Isoflurane, in acute asthma management, 373
- Ketamine, in acute asthma management, 373
- Ketoconazole, for ARDS, 579-580
- Laryngeal cancer, smoking-related, 151
- Leukotriene-modifying agents, in acute asthma management, 373
- in chronic asthma management, 387-388
- Levalbuterol, in acute asthma management, 373
- Limulus anti-LPS factor (LALF), for ARDS, 566
- Lipid(s), serum, smoking effects on, 162-164
- Lipopolysaccharide, for ARDS, 564
- Lipoprotein(s), smoking effects on, 162-164
- Liquid ventilation, in ARDS patients, 422
- Lower extremity(ies), exercise training of, in COPD, 765-767
- Lumen, airway, smoking-related changes in, 14-17
- Lung(s), altered repair mechanisms in, smoking and, 75-76
- asthma effects on, 323-324
- treatment of, 324-326
- functions of, smoking cessation effects on, 79
- smoking effects on, 76-79
- inflammation of, in ARDS, persistence of, 593-596
- smoke deposition in, 70-71
- smoking effects on, 76-79
- transplanted, physiology of, 852-854
- water channels in, localization and distribution of, 483
- water permeability in, measurement of, 483-484
- Lung cancer
- carcinogen dose for, molecular markers of, 90
- diagnosis of, 95-100
- bronchoscopy in, 97
- cervical mediastinoscopy in, 100
- chest radiography in, 95-96
- CT in, 96
- endoscopic ultrasonography with fine needle aspiration in, 98
- MRI in, 96
- PET in, 96-97
- screening in, 95
- sputum cytology in, 97
- thoracentesis in, 98
- thoracoscopy/thoracotomy in, 100
- tissue in, 97-99
- transthoracic needle biopsy in, 97-98
- familiarity of, 89-90
- molecular epidemiology of, smoking and, 87-93
- non-small cell, advanced state, treatment of, 116-117
- early stage, 107-114
- extent of surgical resection following, 109-110
- outcome of surgery for, 108-109
- locally advanced disease, treatment of, 114-116
- staging of, 100-104
- treatment of, 107-120
- adjuvant therapy in, 111-113
- chemotherapy in, 111-112
- neoadjuvant, 113-114
- radiotherapy in, 110-111, 112-113
- risk factors for, genetics in, 89-90
- metabolic gene polymorphisms and variability in, 91-92
- small cell, staging of, 101
- smoking among women and, 50-57
- staging of, 100-104
- overview of, 100
- solitary pulmonary nodule in, 100-101
- tobacco-induced, 88-89



- Lung disease(s), obstructive, smoking-related, pathology of, 11-21. See also under *Obstructive lung disease*.
- smoking-related, 121-137. See also specific diseases.
- airway epithelium changes caused by, 17
- airway wall changes caused by, 17-21
- bacterial pneumonia, 123-124
- common cold, 122-123
- emphysema, 11-14
- immune system dysfunction, 122
- influenza, 123
- interstitial lung diseases, 23-32. See also under *Interstitial lung diseases*.
- large airway changes caused by, 14-21
- pathology of, 11-35. See also specific diseases, e.g., *Emphysema*.
- pulmonary hemorrhage, 124-125
- pulmonary metastatic disease, 125
- pulmonary vasculature changes caused by, 21-23
- systemic inflammation, 122
- tuberculosis, 123
- varicella pneumonitis, 124
- tobacco smoke and, 199
- Lung injuries, cardiopulmonary bypass and, 576
- clinical, lung fluid balance in, alveolar epithelial barrier in, 477-490. See also *Alveolar epithelial barrier*, in *lung fluid balance in clinical lung injury*.
- ventilator-induced, reduction in, in ARDS repair and remodeling, 602
- Lung stretch, lung injury caused by, prevention of, 495-497
- Lung transplantation, for pulmonary emphysema, 849-865. See also *Pulmonary emphysema*, *lung transplantation for*.
- Lung volume reduction surgery, and lung transplantation, for pulmonary emphysema, 859-861
- for emphysema, 658-659, 819-848. See also *Emphysema*, *lung volume reduction surgery for*.
- Lung volume strategy, higher end-expiratory, risks and benefits of, 501
- Lymphocyte(s), B, in chronic asthma, 234-235
- development of, 263-265
- early, 263-264
- T. See *T lymphocytes*.
- Lymphoid hyperplasia, smoking-related, 153-154
- M2-receptor dysfunction, in virus-induced wheezing, 282
- Macrophage(s), in COPD, 624
- Magnesium, in acute asthma management, 270-271
- Magnetic resonance imaging (MRI), in ARDS patients, 431
- in lung cancer, 96
- Major histocompatibility complex (MHC) genes, in asthma, 251-252
- Malnutrition, COPD and, 733
- Marijuana smoking, effects of, 181
- Mast cells, in chronic asthma, 233-234
- Matrilysin, in COPD, 628
- Mecamylamine, in nicotine dependency syndrome, 203
- Mechanical ventilation, in acute lung injury, 491-510.
- See also *Acute lung injury (ALI)*, *mechanical ventilation in*.
- in ARDS, 491-510. See also *Acute respiratory distress syndrome (ARDS)*, *mechanical ventilation in*.
- in COPD, 799-818. See also *Chronic obstructive pulmonary disease (COPD)*, *mechanical ventilation in*.
- postoperative, smoking and, 141
- Mediastinoscopy, cervical, in lung cancer, 100
- Mediator(s), in acute lung injury, 467-476
- Menopause, smoking effects on, 168
- Methylprednisolone group, for ARDS, 567-570
- Methylxanthine(s), for COPD, 728-729
- in chronic asthma management, 384-385
- MHC genes. See *Major histocompatibility complex (MHC) genes*.
- Microsomal epoxide hydrolase, in COPD, 637
- Modulator(s), inflammatory, in acute lung injury, 471-472
- Mononuclear cells, in virus-induced asthma, 295-296
- MRI. See *Magnetic resonance imaging (MRI)*.
- Mucolytic(s), for COPD, 730-731
- Mucous glands, smoking-related changes in, 18-19
- Mucus, chronic asthma and, 237
- increased, in airway remodeling in asthmatics, 333
- Muscle(s). See also specific type.
- bronchial smooth, smoking-related changes in, 20
- Muscle damage, skeletal muscle dysfunction in COPD caused by, 668-669
- Muscle resting hypothesis, 783-785
- testing of, 785-787
- Muscle wasting, causes of, 755-757
- Muscular arteries, in smokers, 22
- Mycoplasma pneumoniae*, asthma caused by, 305-308
- Myocardium, smoking effects on, 164
- Myofibroblast hyperplasia, in asthmatics, 334
- Neck muscles, respiratory muscle drive to, 685
- Nedocromil, in chronic asthma management, 387
- Neutrophil(s), in chronic asthma, 234
- Nicotine, addiction to, degrees of, 201
- genetics of, 638-639
- dependency on, criteria for, 202
- facts and myths concerning, 201
- overdose of, reactions of, 201
- psychopharmacology of, 200
- vasculature effects of, 166
- Nicotine dependency syndrome, management of, 202-207
- behavior modification in, 202
- nonpharmacologic approaches in, 202
- office-related, 204-206
- pharmacologic approaches in, 202-203
- primary care physician's role in, 202
- Nicotine inhaler, in nicotine dependency syndrome, 204
- Nicotine nasal spray, in nicotine dependency syndrome, 203-204
- Nicotine polacrilex, in nicotine dependency syndrome, 203
- Nicotine transdermal patches, in nicotine dependency syndrome, 203
- Nicotine withdrawal syndrome, 201
- NIPPV. See *Noninvasive positive-pressure ventilation (NIPPV)*.
- Nitric oxide, as gas, 519-521
- as "selective" pulmonary vasodilator, 521-522
- exhaled, and airway caliber, 355-356
- and bronchial reactivity, 356
- and induced sputum, 355
- bronchoscopic markers of airway inflammation and, 355
- constitutive production of, 351-352
- correlation with other outcome measures, 355
- described, 351
- detection of, 353-354
- endogenous sources of, 353

Nitric oxide (*Continued*)

- exogenous sources of, 352-353
- flow dependence of, 354
- in airway inflammation assessment, 352
- future of, 356
- inducible synthase and inflammation, 352
- invasiveness of, 355
- lower respiratory tract, measurement of, 352-354
- restricted technique with, 354
- safety of, 355
- test procedures effects on, 356
- for ARDS, 573-574
- inhaled, and acute lung injury, 519-529. See also *Acute lung injury (ALI), inhaled nitric oxide and*.
- delivery system, 523
- impact on bronchial tree and surfactant, 522
- in ARDS, clinical trials of, 525-527
- mechanism of action of, 521
- with DNA, 520-521
- with hemoglobin, 520
- with oxygen derivatives, 521
- with thiols, 520
- Noninvasive positive-pressure ventilation (NIPPV), for COPD exacerbations, 714-715
- in acute lung injury, 504-505
- in ARDS, 504-505
- Noninvasive ventilation, in COPD, 783-797. See also *Chronic obstructive pulmonary disease (COPD), noninvasive ventilation in*.
- Nutritional abnormalities, in COPD, 753-762. See also *Chronic obstructive pulmonary disease (COPD), nutritional abnormalities in*.
- Nutritional status, and exercise limitations, 699-700

- Obstructive apneas, prenatal and postnatal smoke exposure on development of, 43
- Obstructive lung disease, emphysema, 11-14. See also *Emphysema*.
- large airways changes caused by, 14-21
- smoking-related, pathology of, 11-21
- Occupational lung carcinogens, smoking and, 90-91
- Office spirometry, 650-651
- Oligonucleotide(s), immune modulation using, 272
- Oral cavity, cancer of, smoking-related, 149
- Oral contraceptives, smoking in users of, 168
- Oropharyngeal cancer, smoking-related, 149-151
- Otitis media, smoking-related, 154
- Oxidant-antioxidant hypothesis, 74-75
- Oxygen, controlled, for COPD exacerbations, 709-710
- for COPD, 731
- Oxygen derivatives, nitric oxide with, 521
- Oxygen mixtures, in acute asthma management, 372
- Oxygen therapy, for COPD, 673
- Oxygenation, prone ventilation effects on, in ARDS, 511-512

- Partial liquid ventilation, for ARDS, 543-554. See also *Perfluorocarbon liquids, for ARDS*.
- PEEP. See *Positive end-expiratory pressure (PEEP)*.
- Pentoxifylline, for ARDS, 579
- Perflubron, 544
- physical properties of, 544
- Perfluorocarbon(s), described, 544
- Perfluorocarbon liquid(s), clinical studies with, 549-551
- described, 544
- for ARDS, 543-554

- Perfluorocarbon liquid ventilation, techniques of, 544-546
- Periodontal disease, smoking-related, 153
- Peripheral muscle dysfunction, in COPD, 665-677. See also *Chronic obstructive pulmonary disease (COPD), peripheral muscle dysfunction in*.
- Peripheral muscle weakness, exercise and, 699
- Permissive hypercapnia (PHC), for ARDS, 580
- in acute lung injury, 501-502
- in ARDS, 501-502
- PET. See *Positron emission tomography (PET)*.
- Physiotherapy, for COPD exacerbations, 715-716
- Placental transmogrification, 13
- Pneumonia, in ARDS patients, 427
- postoperative, smoking and, 140-141
- Pneumonitis, hypersensitivity, smoking and, 131-132
- varicella, smoking effects on, 124
- Pneumothorax, spontaneous, smoking and, 125-126
- Polymyxin B (PMB), for ARDS, 566
- Positive end-expiratory pressure (PEEP), effects on chest film in ARDS patients, 428-429
- intrinsic, in COPD, 805-807
- Positron emission tomography (PET), in lung cancer, 96-97
- Preacinar arteries, 452
- Pregnancy, smoking during, 4
- Pressure control ventilation, in acute lung injury, 503
- in ARDS, 503
- Primary determinant, of arterial oxygenation, 503
- Proliferative phase, in ARDS, 440-451
- Prone ventilation, for ARDS, 511-517. See also *Acute respiratory distress syndrome (ARDS), prone ventilation for*.
- Prostaglandin(s), for ARDS, 571-574
- Protease inhibitors, for COPD, 732
- Protease-antiprotease hypothesis, 71-73
- Protein(s), vitamin D binding, in COPD, 638
- Proteinase-antiproteinase balance, in COPD, 625-629
- Pulmonary arteries, anatomy of, 451-452
- Pulmonary diseases. See *Lung disease(s)*.
- Pulmonary edema, increased-permeability, cardiogenic versus noncardiogenic, in ARDS patients, 428
- Pulmonary emphysema, lung transplantation for, 849-865
- and lung volume reduction surgery, 859-861
- benefits of, 854-857
- patient selection for, 849-851
- risks associated with, 854-857
- single lung versus bilateral lung, 857-859
- Pulmonary hemorrhage, smoking and, 124-125
- Pulmonary metastatic disease, smoking and, 125
- Pulmonary vascular remodeling, in ARDS, 451-458
- Pulmonary vasculature, in ARDS, 452-458
- smoking-related changes in, 21-23

## Quality of life, in ARDS survivors, 414-415

- Race, as factor in smoking, 4-5
- Radical scavengers, for ARDS, 564
- Radiography, chest, in ARDS patients, 419-421
- in lung cancer, 95-96
- Radionuclide examinations, in ARDS patients, 429
- Radiotherapy, in stage I non-small cell lung cancer, 110-111, 112-113
- Reactive oxygen species (ROS), 174
- tobacco use effects on, 174-175

- Reinke's edema, smoking-related, 154-155
- Respiratory bronchiolitis, HRCT in, 660  
smoking and, 127-128
- Respiratory distress syndrome, neonatal, and ARDS, similarities between, surfactant replacement therapy in, 534-535
- Respiratory failure, severe, extracorporeal life support for, 555-561. See also *Extracorporeal life support*.  
case examples of, 555  
indications for, 555-556
- Respiratory muscle(s), function of, in COPD, 679-684  
in breathing, 685-687  
performance of, therapeutic interventions in improvement of, 687-689
- Respiratory muscle drive, 684-689  
global inspiratory muscle drive, 684  
to abdominal muscles, 685  
to neck muscles, 685  
to specific respiratory muscles, 684-685
- Respiratory muscle function, 679-684  
in COPD, 679-692
- Respiratory muscle training, in COPD, 773-774
- Respiratory stimulants, COPD and, 734
- Respiratory syncytial virus (RSV), and immune response, 291-292  
asthma caused by, 291-292
- Respiratory tract, lower, exhaled nitric oxide, measurement of, 352-354  
upper, malignant disorders of, smoking-related, 147-152  
nonmalignant disorders of, smoking-related, 152-155  
premalignant lesions of, 148-149
- Respiratory tract infections, smoking and, 122-124
- Respiratory viruses, airway inflammation caused by, 294-296  
asthma caused by, 289-300. See also *Asthma, virus-induced*.  
infection caused by, 281-282, 283  
inflammation caused by, 281-282
- Rheumatoid arthritis, smoking and, 130-131
- Rhinitis, smoking-related, 153
- Salivary gland tumors, smoking-related, 151
- "Salt and pepper" pattern, 423
- Sarcoidosis, smoking and, 132-133
- Serine proteinase inhibitors, in COPD, 626-629
- Serum lipids, smoking effects on, 162-164
- Sex hormones, smoking and, 167-168
- Sickness Impact Profile (SIP), 414-415
- SIDS. See *Sudden infant death syndrome (SIDS)*.
- Sinusitis, smoking-related, 153
- Sleep hypnosis, 785  
testing of, 787
- Smoke. See also under *Smoking*.  
children's exposure to, 37-38  
postnatal exposure to, allergies caused by, 42-43  
asthma caused by, 41-42  
obstructive apneas caused by, 43  
respiratory symptoms caused by, 39-40  
SIDS caused by, 43  
prenatal exposure to, allergies caused by, 42-43  
asthma caused by, 41-42  
obstructive apneas caused by, 43  
SIDS caused by, 43  
regional deposition in lung, 70-71  
tobacco. See *Tobacco smoke*.  
utero exposure to, respiratory effects of, 38-39
- Smokeless tobacco use, 6-7
- Smoking. See also *Smoke; Tobacco use*.  
airway obstruction caused by, 141-143  
and altered repair mechanisms in lung, 75-76  
and cancer, 177-179  
and cardiovascular disease, 159-172  
epidemiology of, 159-162  
in women, 166-168  
cardiovascular risks associated with, 167  
patterns of, 166-167  
rates of, 166-167  
and COPD, 67-86, 179-180. See also *Chronic obstructive pulmonary disease (COPD), smoking-related*.  
and lung diseases, 121-137. See also *Lung disease(s), smoking-related*.  
interstitial, 126-133  
and occupational exposure interactions, 90-91  
and pediatric respiratory health, 37-46  
and pulmonary hemorrhage, 124-125  
and pulmonary metastatic disease, 125  
and respiratory tract infections, 122-124  
and sex hormones, 167-168  
and spontaneous pneumothorax, 125-126  
arterial stiffening caused by, 165  
arterial wall effects of, 164-165  
atherogenesis caused by, 165-166  
blood effects of, 162  
cardiovascular disease effects of, 176-177  
cardiovascular system effects of, 162-166  
cessation of. See *Smoking cessation*.  
cigar, effects of, 151-152  
cigarette. See *Cigarette smoking*.  
COPD caused by, 645-646, 705-706  
costs of, 2, 189-197  
external, 191-192  
family, 191  
individual, 190-191  
medical, 192-193  
overviews of, 190  
societal, 193-195  
diseases related to, 173-187  
during pregnancy, 4  
education and, 5  
ethnicity as factor in, 4-5  
future of, 7-8  
gastroesophageal reflux disease caused by, 152-153  
genetics of, 638-639  
geographic predilection for, 6  
hypopharyngeal cancer caused by, 149-151  
in oral contraceptive users, 168  
inflammatory immune responses caused by, 175-176  
laryngeal cancer caused by, 151  
lipoprotein effects of, 162-164  
lung cancer caused by, molecular epidemiology of, 87-93  
lung diseases caused by, pathology of, 1-35. See also specific diseases, e.g., *Emphysema and Lung disease(s), smoking-related*.  
lung function effects of, 76-79  
lung histopathology effects of, 71  
lymphoid hyperplasia caused by, 153-154  
malignant disorders of upper respiratory tract caused by, 147-152  
marijuana, effects of, 181  
mechanical ventilation effects on, 141  
menopausal effects of, 168  
myocardial effects of, 164  
nonmalignant disorders of upper airway caused by, 152-155  
oral cavity cancer caused by, 149

Smoking (*Continued*)

- oropharyngeal cancer caused by, 149-151
- otitis media caused by, 154
- periodontal disease caused by, 153
- perioperative pulmonary complications of, **139-146**
- postoperative pneumonia caused by, 140-141
- prevalence of, gender-related, 3-4
- race as factor in, 4-5
- Reinke's edema caused by, 154-155
- rhinitis caused by, 153
- salivary gland tumors caused by, 151
- second-hand, effects of, 180-181
- serum lipid effects of, 162-164
- sinusitis caused by, 153
- trends concerning, 2-3
  - in U.S., 3
- upper airway complications of, **147-157**
- vocal cord inflammation caused by, 154-155
- Smoking cessation, 7, 143-145, **199-208**
  - benefits of, 199-200
  - bupropion in, 203, 204-207
  - effects on lung function, 79
  - in COPD, 723-724
  - mecamylamine in, 203
  - nicotine inhaler in, 204
  - nicotine medication in, 203-204
  - nicotine nasal spray in, 203-204
  - nicotine polacrilex in, 203
  - nicotine transdermal patches in, 203
  - nonpharmacologic approaches to, 202
  - pharmacologic approaches to, 202-203
  - relapses following, 206-207
  - spirometry effects on, 647-650
- Smooth muscles, alterations in, in airway remodeling in asthmatics, 333
  - of airways, hypertrophy and hyperplasia of, chronic asthma and, 236
- Spirometry, in COPD, criteria for, 646-647
  - effect on smoking cessation, 647-650
  - follow-up, 651
  - office, 650-651
- Spontaneous pneumothorax, smoking and, 125-126
- Sputum, analysis of, in airway inflammation assessment, 346-351
  - induced, cellular and soluble phases of, 346
  - exhaled nitric oxide and, 355
  - in asthma, future application of, 351
  - uses of, 346-348
  - method of, 348-349
  - processing of, 349
  - reproducibility of, 349
  - safety of, 348-349
  - test procedures effects on, 349-351
- Sputum cytology, in lung cancer, 97
- Steroid(s), in acute asthma management, 365-368
  - inhaled, in acute asthma management, 373
  - intramuscular, in acute asthma management, 374-375
- Strength training, in COPD, 770-771
- Stretch, lung, lung injury caused by, prevention of, 495-497
- Subepithelial fibrosis, chronic asthma and, 236
  - in asthmatics, 333-334
- Sudden infant death syndrome (SIDS), prenatal and postnatal smoke exposure on development of, 43
- Suppressor T cells, 226
- Surfactant, exogenous, ARDS treatment in patients with, 535-538
  - for ARDS, 564, 578
  - nitric oxide inhalation impact on, 522
  - repletion of, in ARDS repair and remodeling, 603
- Surfactant replacement therapy, in ARDS, **531-541**. See also *Acute respiratory distress syndrome (ARDS), surfactant replacement therapy in*.
- Surfactant system, lung, in ARDS patients, abnormalities of, 531-539
- T lymphocytes, in chronic asthma, 226-230
  - activation of, 227-228
  - Th2-type cytokine, 228-230
- Th cells, 226
- Th1 cells, in Th2 disease, 270
- Th1 phenotype, changes in, for therapeutic uses, 269-270
- Th1/Th2 paradigm, in asthma, **263-277**. See also *Asthma, Th1/Th2 paradigm in*.
- Th2 cells, development of, factors in regulation of, 266-267
  - intracellular signaling for, 267-268
  - in atopic subjects, factors in induction, 268-269
  - in Th1 disease, 270
- Th2 phenotype, changes in, for therapeutic uses, 269-270
- Th2-type cytokines, 228-230
- Theophylline, for COPD, 728-729
  - for COPD exacerbations, 710-711
  - in chronic asthma management, 384-385
- Thiol(s), nitric oxide with, 520
- Thoracentesis, in lung cancer, 98
- Thoracoscopy/thoracotomy, in lung cancer, 100
- Tissue inhibitors of matrix metalloproteinases (TIMPS), 627
- TNF. See *Tumor necrosis factor (TNF)*.
- Tobacco, history of, 1-2
  - smokeless, effects of, 180
- Tobacco chewing, effects of, 180
- Tobacco smoke, and lung disease, 199
  - environmental, exposure of children to, effect on severity of asthma, 42
  - lung function changes in children exposed postnatally to, 40-41
  - lung cancer caused by, molecular epidemiology of, 87-88
- Tobacco use. See also *Smoking*.
  - by children and adolescents, 5-6
  - cessation of, 7
  - costs of, 2
  - diseases related to, **173-187**
  - epidemiology of, **1-9**
  - ethnicity as factor in, 4-5
  - future of, 7-8
  - modes of, 6-7
  - prevalence of, gender-related, 3-4
  - race as factor in, 4-5
  - smokeless, 6-7
  - trends concerning, in U.S., 3
- Tracheal gas insufflation (TGI), in acute lung injury, 502
  - in ARDS, 502
- Transplantation, lung, for pulmonary emphysema, **849-865**. See also *Pulmonary emphysema, lung transplantation for*.
- Transthoracic needle biopsy (TNB), in lung cancer, 97-98
- Tuberculosis, smoking effects on, 123
- Tumor(s), salivary gland, smoking-related, 151
- Tumor necrosis factor (TNF), in acute lung injury, 470, 472
  - in asthma, 253
- Tumor necrosis factor (TNF)- $\alpha$ , in COPD, 638

- Ultrasonography, endoscopic, with fine needle aspiration, in lung cancer, 988  
 Upper extremity(ies), exercise training of, in COPD, 771-773  
 U.S. Public Health Service Surgeon General's Report on Smoking and Health, findings of, 49
- Vaccination, for COPD, 724  
 Varicella pneumonitis, smoking effects on, 124  
 Vascular congestion, in asthmatics, 334  
 Vasodilator(s), for ARDS, 564  
 Ventilation, inverse ratio, in acute lung injury, 503-504  
   in ARDS, 503-504  
   liquid, in ARDS patients, 422  
   mechanical. See *Mechanical ventilation*.  
   noninvasive, in COPD, 783-797. See also *Chronic obstructive pulmonary disease (COPD)*, *noninvasive ventilation in*.  
   noninvasive positive-pressure, for COPD exacerbations, 714-715  
   perfluorocarbon liquid, techniques of, 544-546  
   pressure control, in acute lung injury, 503  
   in ARDS, 503  
   prone, for ARDS, 511-517  
 Ventilator(s), lung injuries caused by, reduction in, in ARDS repair and remodeling, 602  
   mechanical, in COPD. See also *Chronic obstructive pulmonary disease (COPD)*, *mechanical ventilation in*.  
     setting of, 801-805  
 Ventilatory failure, acute, pathophysiology of, 799-800  
 Ventilatory function, natural history of, smoking effects on, 76-78  
 Ventilatory responses, to hypoxia and hypercapnia, in COPD, 639-640  
 Viral infections, and responses to allergen, interactions between, 296  
 Virus(es), COPD exacerbation caused by, 707-708  
   in atopic asthma development, 279-287. See also *Asthma, virus-induced*.  
     respiratory. See *Respiratory viruses*.  
 Vitamin(s), for COPD, 732-733  
 Vitamin D binding protein, in COPD, 638  
 Vocal cord, inflammation of, smoking-related, 154-155  
 von Willebrand's factor (vWF) antigen, 407
- Weight loss, causes of, 755-757  
 Wheezing, virus-induced, eosinophils and M2-receptor dysfunction in, 282  
 Women, smoking and cardiovascular disease in, 166-168
- Xenobiotic metabolizing enzymes, in COPD, 637-638  
 XOMEN E5, 564